Ozgur Kara

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Research Statement

My ultimate research objective is to develop controllable/understandable/manipulatable generative models for **2D, video** applications in computer vision. Beyond these, I also worked on point tracking, continual learning, and inverse image problems during my previous internships.

Education

Georgia Institute of Technology PhD in Machine Learning, MSc in Computer Science, USA **2022 Fall-2027**
Advisors: Prof. Dr. James Rehg **GPA: 4.00/4.00**
Notes: Awarded with Departmental Fellowship

International Computer Vision Summer School (ICVSS'23) Sicily, Italy **July 2023**

Bogazici University BSc in Electrical Electronics Engineering, Istanbul, Turkey **2018-2022**
Advisors: Prof. Dr. Lale Akarun, Prof. Dr. Murat Saraçlar **GPA: 3.92/4.00**
Undergraduate Thesis: Data Discovery and Domain Adaptation for Isolated Sign Language Recognition
Notes: Awarded with Outstanding Success Scholarship. Graduated with High Honours.

Publications

CVPR 2024 **RAVE: Randomized Noise Shuffling for Fast and Consistent Video Editing with Diffusion Models**
Kara, O.*, Kurtkaya, B.*, Yesiltepe, H., Rehg, J., Yanardag, P.
IEEE/CVF Conference on Computer Vision and Pattern Recognition 2024
[Project Webpage][Paper][Code][HuggingFace Demo]

IEEE FG 2024 **Transfer Learning for Cross-dataset Isolated Sign Language Recognition in Under-Resourced Datasets**
Kindiroglu, A., **Kara, O.**, Ozdemir, O., Akarun, L.
IEEE International Conference on Automatic Face and Gesture Recognition 2024 [Paper] [Code]

CVPR 2022 **ISNAS-DIP: Image-Specific Neural Architecture Search for Deep Image Prior**
Arican, M.*, **Kara, O.***, Bredell, G., Konukoglu, E. (*** denotes equal contribution**)
IEEE/CVF Conference on Computer Vision and Pattern Recognition 2022
[Paper][Code][Video]

IEEE TAC 2022 **Domain-Incremental Continual Learning for Mitigating Bias in Facial Expression and Action Unit Recognition**
Churamani, N., **Kara, O.**, Gunes, H.
IEEE Transactions on Affective Computing, 2022 [Paper][Code]

NanoComm 2022 **Molecular Index Modulation using Convolutional Neural Networks**
Kara, O., Yaylali, G., Pusane, A., Tugcu, T.,
Nano Communication Networks Journal, 2022 [Paper] [Code]

HRI 2021 **Towards Fair Affective Robotics: Continual Learning for Mitigating Bias in Facial Expression and Action Unit Recognition**
Kara, O., Churamani, N., Gunes, H.,
In Proceedings of the Workshop on Lifelong Learning and Personalization in Long-Term Human-Robot Interaction (LEAP-HRI), March, 2021 [Paper][Code]

Brain Stimulation 2021 **Neuroweaver: a platform for designing intelligent closed-loop neuromodulation systems**
Sarikhani, P., Hsu, H., **Kara, O.**, Kim, J., Esmaeilzadeh, H., Mahmoudi, B.
Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, Elsevier, 2021 [Paper][Code]

Research Experience

Georgia Institute of Technology, Rehg Lab, Supervised by Prof. Dr. James Rehg **2023 Spring - Present**
- Scene conditioned 3D object texture editing
- Text guided video editing with diffusion models (**CVPR 2024**)
- Finding learnable directions in latent space of diffusion models for mitigating bias (poster presented in **ICVSS 2023**)
- Worked on point tracking

EPFL, Visual Intelligence and Learning Lab, Supervised by Asst. Prof. Dr. Amir Zamir **2022 Summer**
- Interpretability and explainability of Vision Transformer (ViT) (**Summer@EPFL**, 2% admission rate)

Bogazici University, Perceptual Intelligence Laboratory, Supervised by Prof. Dr. Lale Akarun **2021 Fall - 2022 Spring**
- Transfer learning for under resourced sign language recognition dataset (**IEEE FG 2024**)

ETH Zurich, Computer Vision Lab, Supervised by Assoc. Prof. Dr. Ender Konukoglu **2021 - 2022**
- Training-free neural architecture search (NAS) for image restoration (**CVPR 2022**)

University of Tübingen, Explainable Machine Learning Group, Supervised by Prof. Dr. Zeynep Akata **2021 Spring**

- Research on few-shot and generalized zero-shot learning for image classification using generative models.

University of Cambridge, Affective Intelligence & Robotics Lab, Supervised by Prof. Dr. Hatice Gunes **2020 - 2021**
- Fairness in facial expression recognition (**IEEE TAC 2022**) (**LEAP-HRI 2021**)

Teaching Experience

Georgia Institute of Technology
- ECE2026 - Introduction to Signal Processing, Graduate Teaching Assistant **2022 Fall**

Professional Service

Reviewer: NeurIPS, ICLR, ICML, ECCV
Mentor: Google Summer of Code 2022, 2023, 2024
Open Source Contributor: Google Summer of Code 2021

Professional Experience

AiTerna Technologies, AI Engineer **2022-2023**
- Graph neural network based fashion recommender and virtual try on pipeline on Google Cloud Platform (**Elfai**)

Scholarships

- Georgia Tech ECE Departmental Fellowship **2022-2023**
- 2205 TUBITAK[1] Undergraduate Scholarship Holder **2022**
- Outstanding Success Scholarship Holder from Turkish Educational Foundation (TEV). **2019-2022**
- 2247-C TUBITAK[1] Research Internship Scholarship **2021-2022**

Awards & Programs & Competitions

- **International Computer Vision Summer School (ICVSS) 2023 attendee** - Italy, Sicily, Analysis of Controllability and Fairness in Diffusion Models **2023**
- **CIMPA Research School on Graph Structure and Complex Network Analysis attendee** - Nesin Koyu **2023**
- **Summer@EPFL program attendee** - Visual Intelligence and Learning Lab **2022**
- **Placed among top-50 teams, globalwide** - Google Develeoper's Solution Challenge, Peter **2022**
- **3rd place** - Yildiz Bootcamp and it was directly invited to Yildiz Technopark Pre-Incubation Program, Peter **2022**
- **Successfully completed** - Google Summer of Code, "Graphical User Interface for OpenAI Gym" project **2021**
- **3rd place out of 172 projects** - TUBITAK[1] Undergraduate Research Project Competition, Machine Learning Based Receiver Design for Molecular Communication **2021**
- **Placed among top-10 teams, regionwide** - Google Solution Challenge, "Torch in Darkness" **2020**
- **1st place out of 100 projects** - TUBITAK[1] Undergraduate Research Project Competition, Joint Depth Estimation and Object Detection Software **2020**
- **3rd place out of 15 projects** - IEEE METU Pixery Hackathon, Mobile Application for Blind People **2020**
- **Finalist out of 75 teams** - Turkish Airlines Travel Datathon and Machine Learning Competition **2019**
- **180th among 2 million** - Turkish National University Entrance Exam **2018**
- **Republic Honour Award** - Kadikoy Anadolu High School. Given to one out of 340 students each year **2018**
- **3rd place nationwide** - TUBITAK[1] High School Research Project Competition, Drone for Landmine Detection Using GPS **2018**
- **1st place regionwide**- TUBITAK[1] High School Research Project Competition, An Autonomous Hexapod For Helping Search Teams After Earthquake **2017**
- **Accepted** - CS Bridge program which offers a two-week programming course from Stanford's TAs **2016**

Additional

- I am a hiking enthusiast, especially in the Swiss Alps. So far, I have visited 13 out of 50 states in the USA and most of the European countries.
- **Social Event Organizer** in Turkish Student Association at Georgia Institute of Technology.
- Founder of a YouTube channel Özgür's Philosophy, where I share my experiences of my academic life with younger generations
- Was a member of AirBenders, an UAV team at Bogazici University
- Founder of Metakultur platform, which involves blogs about the developments in science, cultural activities, etc.

[1] The Scientific and Technological Research Council of Turkey